

SUBA
1. A method of determining local multicast information of a local area network (LAN), comprising:

5 dividing the LAN to a number of segments larger than the number of virtual LANs (VLANs) in the network; and

creating a layer-3 multicast routing table, which relates to each of the segments separately.

10 2. A method according to claim 1, wherein the layer-3 multicast routing table lists in each of its entries the segments to which matching packets should be routed.

3. A method according to claim 1, wherein the layer-3 multicast routing table identifies interfaces according to a VLAN and a port.

15 4. A method according to claim 1, wherein the layer-3 multicast routing table lists for substantially each entry a legal interface which is identified by a VLAN and a port.

5. A method according to claim 1, wherein dividing the LAN to a plurality of segments
20 comprises dividing such that at least some of the segments are physically distinct.

6. A method according to claim 1, wherein dividing the LAN to a plurality of segments comprises dividing at least one of the VLANs of the LAN to a plurality of segments.

25 7. A method according to claim 1, wherein dividing the LAN to a plurality of segments comprises dividing such that each group of one or more links which connects two or more hosts, routers or layer-3 switches is a separate segment for each of the VLANs which pass on the group of links.

30 8. A method according to claim 1, wherein dividing the LAN to a plurality of segments comprises dividing such that, for each VLAN, a backbone segment is defined as including all the groups of one or more links which connect two or more routers or layer-3 switches in the VLAN.

9. A method according to claim 8, wherein the links not included in the backbone segment for each VLAN are divided to separate segments in each VLAN, each segment including a group of one or more links which connect one or more hosts to a router or layer-3 switch.
10. A method according to claim 1, wherein managing multicast related information for each of the segments separately comprises determining for each segment separately whether multicast packets should be routed to the segment.
11. A method according to claim 1, wherein managing multicast related information for each of the segments separately comprises performing the IGMP protocol in each of the segments separately.
12. A method according to claim 1, wherein the layer-3 switches of the LAN do not forward IP multicast routing related packets in layer-2.
13. A method according to claim 1, wherein the layer-3 switches of the LAN do not perform multicast filtering in layer-2.
14. A method of forwarding multicast packets by a layer-3 switch, comprising:
receiving a multicast packet by the switch through a first physical port on a first VLAN; and
routing the multicast packet in layer-3 out a second physical port of the switch, on the first VLAN.
15. A method according to claim 14, wherein routing the multicast packet comprises reducing the time to live (TTL) value of the packet.
16. A method according to claim 14, wherein the second physical port leads to at least one layer-3 switch or router.

17. A method according to claim 14, wherein the multicast packet is not bridged in layer-2 through the second physical port.

18. A method according to claim 14, wherein the multicast packet is bridged in layer-2 through a third physical port of the layer-3 switch.

19. A method according to claim 14, wherein the multicast packet is not bridged in layer-2 through any of the physical ports of the switch.

20. A method of forwarding multicast packets within a single VLAN, comprising:
receiving the multicast packets by a first switch connected to the VLAN;
routing the multicast packets in layer-3 to a second switch connected to the VLAN; and
routing the multicast packets in layer-3 by the second switch through an interface included in the VLAN.

21. A method according to claim 20, wherein routing the multicast packets in layer-3 by the second switch comprises routing to a host connected to the VLAN.

22. A method according to claim 20, wherein routing the multicast packets in layer-3 by the second switch comprises routing to a third switch connected to the VLAN.

23. A method of forwarding multicast packets within a single VLAN, comprising:
receiving multicast packets of a specific destination address and source address by a first switch connected to the VLAN;

routing the received multicast packets in layer-3, by the first switch, to at least one first host connected to the VLAN;

receiving multicast packets of the specific destination address and source address by a second switch connected to the VLAN; and

routing the multicast packets in layer-3, by the second switch, to at least one second host.

24. A method according to claim 23, wherein the first switch is directly connected to the at least one first host.

25. A method according to claim 23, comprising routing the multicast packets from the first switch to the second switch.
- 5 26. A switch, comprising:
a plurality of ports;
a layer-2 bridging unit which bridges packets between the ports responsive to their destination MAC address and their VLAN; and
a multicast detector which identifies a group of at least some of the IP multicast routing
10 related packets received by the switch, the group including IGMP queries, and prevents the layer-2 bridging unit from bridging the identified packets at least through ports which do not lead to at least one neighboring layer-3 switch or router.
- 15 27. A switch according to claim 26, wherein the multicast detector prevents the layer-2 bridging unit from bridging the identified packets through any of the ports of the switch.
28. A switch according to claim 26, wherein the layer-2 bridging unit bridges at least some of the identified packets through a plurality of ports.
- 20 29. A switch according to claim 26, wherein the multicast detector allows bridging in layer-2 of at least some of the identified packets, through one or more ports which lead to at least one neighboring layer-3 switch or router.
- 25 30. A switch according to claim 29, wherein the bridging unit bridges in layer-2 packets received through a port which leads to at least one other layer-3 switch or router, through other ports which lead to at least one neighboring layer-3 switch or router.
- 30 31. A switch according to claim 26, wherein the multicast detector identifies the packets at least responsive to their protocol field.
32. A switch according to claim 26, wherein the group of packets identified by the multicast detector comprises substantially all the IP multicast routing related control packets received by the switch.

33. A switch according to claim 32, wherein the group of packets identified by the multicast detector comprises substantially all the IP multicast routing related packets received by the switch.

34. A switch according to claim 26, comprising a layer-3 routing unit which routes at least some IP multicast routing related packets between ports of the same VLAN.

35. A switch according to claim 26, wherein the multicast detector prevents the layer-2 bridging of packets, irrespective of the IP destination address of the packets.

36. A switch according to claim 26, wherein the multicast detector prevents the layer-2 bridging of packets, irrespective of the MAC destination address of the packets.

37. A switch according to claim 26, wherein the multicast detector prevents the layer-2 bridging of packets, irrespective of subscription information of hosts directly connected to the switch.

38. A layer-3 switch, comprising:
at least one VLAN interface which does not have an associated IP router interface; and
a layer-3 output unit which directs IP packets with a MAC source address of the switch through the at least one VLAN interface.

39. A switch according to claim 38, wherein the packets directed through the at least one VLAN interface, by the layer-3 output unit, include IP packets routed by the switch in layer-3.

40. A switch according to claim 38, wherein the packets directed through the at least one VLAN interface, by the layer-3 output unit, include IP packets generated by a higher layer of the switch.

41. A switch according to claim 38, wherein the packets directed through the at least one VLAN interface, by the layer-3 output unit, include packets of a routing protocol.

42. A switch according to claim 38, wherein the packets directed through the at least one VLAN interface, by the layer-3 output unit, include IP multicast packets.

43. A switch according to claim 42, wherein the packets directed through the at least one VLAN interface, by the layer-3 output unit, include IP multicast routing related control packets.

44. A switch according to claim 38, wherein the layer-3 output unit directs packets through the at least one VLAN interface, with an IP source address associated with a different VLAN interface of the switch.

45. A method of forwarding packets, comprising:
receiving a packet with a source MAC address and a TTL value;
changing the source MAC address of the received packet; and
forwarding the packet with the changed MAC address but with the same TTL value.

46. A method according to claim 45, wherein receiving the packet comprises receiving an IP multicast data packet.

47. A method according to claim 45, wherein forwarding the packet comprises forwarding within the same VLAN from which the packet was received.

48. A switch, comprising:
a plurality of ports;
a layer-3 multicast routing table, which identifies interfaces to which multicast packets should be routed according to both a VLAN and a port; and
a multicast routing unit which routes multicast packets between the ports of the switch based on entries of the multicast routing table.

49. A switch according to claim 48, wherein the layer-3 multicast routing table may operate in a first mode in which interfaces are identified by both a VLAN and a port or in a second mode in which interfaces are identified only by a VLAN.